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# Knowledge and attitudes toward Do-Not-Resuscitate decisions among medical students in Jeddah, Kingdom of Saudi Arabia

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## ABSTRACT

**Objective:** Do-Not-Resuscitate (DNR) order is made in certain situations where patients are terminally ill and CPR is not predictable to succeed. Furthermore, many controversial ethical challenges arise in the management of death because of patients' religious and cultural background. In the Kingdom of Saudi Arabia, KSA the DNR policies and strategies are guided by Islamic fatwa. Therefore, this study aimed to assess knowledge and attitudes toward DNR decisions among medical students Jeddah, KSA. **Methodology:** Cross-sectional study was conducted with a validated online questionnaire on 425 medical students in Jeddah, KSA. This study included medical students from all academic years in Jeddah, KSA, and excluded first-year college and medical students from Jeddah University and Fakeeh Medical College. **Results:** The questionnaire was completed by 425 participants; the majority of them were female (72.71%). Of the 425 participants, (82.8%) were familiar with the DNR term, which was significant with participants with higher academic levels ( $P=0.000290$ ). However, only (28.69%) were able to choose the correct definition. Only (11.6%) participants had previous experience with DNR. Most respondents did not know if there was a policy (59.5%) or fatwa (62.6%) regarding DNR. **Conclusion:** Our results clearly showed a significant lack of understanding of DNR among medical students in Jeddah, KSA. Therefore, we suggest that more ethical education regarding DNR and its policies should be conducted during medical education in the KSA.

**Keywords:** DNR, attitude, evaluation, knowledge, medical student.

## 1. INTRODUCTION

Do not resuscitate (DNR) is a clinical instruction that indicates that cardiopulmonary resuscitation (CPR) should not be initiated if a patient is in cardiac or respiratory arrest (Al-Ahmadi et al., 2020). The DNR decision is



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made in certain situations where patients are severely ill, death is inevitable, and CPR is not expected to succeed (Aljohaney et al., 2015; Sham et al., 2007). However, it should not be confused with stopping the treatment, as DNR has a different concept (Walsh et al., 2017; Fuchs et al., 2017). This end-life order is given by a licensed doctor or representative authority depending on local policy and the DNR order must be notarized and dated to be valid. In most cases, a DNR decision comes after a documented discussion with the patient or their family about resuscitation interventions to avoid any miscommunication of the order and ensure that the information delivered to the patients, family, and health-care providers is clear (Breault et al., 2011).

Many controversial ethical challenges arose in the management of death because of the patient's religious and cultural background. In Islamic religion, individuals believe that human life is sacred and must be protected, which leaves physicians with a moral and ethical dilemma when it comes to DNR (Aljohaney et al., 2015). In the KSA, DNR policies and strategies are guided by the Islamic fatwa, which is a legal view of Islamic instructions. A fatwa that was published in 1988 by the Permanent Committee for Ifta and Scholarly Research by the number 12086 has been the basis of DNR policies in the KSA (Breault et al., 2011; Chamsi-Pasha et al., 2017). According to it, "If three truthful and expert consultants decide that resuscitation is futile, DNR order will be started regardless of the patient's and family's desires" (Amoudi et al., 2016).

Several attempts have been made to assess the attitudes of the health-care community regarding DNR orders in the KSA; Almobeerik conducted the first study in 2000, which investigated Saudi physicians' attitudes toward DNR orders for the elderly through a survey. The study concluded that most Saudi physicians cared about the functional status of the patient more than age. While they shared many features with physicians in the West, they were concerned about DNR's religious and legal aspects. This behavior may be the result of a lack of defined local policies and guidelines (Al-Mabeireek et al., 2000). Another study by Amoudi (2016) investigated the interns' and residents' perspectives toward DNR policies in the KSA. This recommends that in KSA medical ethics classes, the subject of DNR and the handling of DNR patients should be emphasized. It also calls for expending more effort in formulating national DNR laws that ensure that the patient is involved in the decision-making process (Amoudi et al., 2016).

In 2018, a cross-sectional study was carried out at King Abdulaziz University Hospital (KAUH) in Jeddah to assess patients' and their families' knowledge and attitudes concerning DNR. The study involved 400 participants. Among them, 54% were patients' relatives, and around 60% were female. 44.8 % of the 105 people who were aware of the DNR term chose the correct definition, and 5.2 % had prior experience with the DNR term, and 34.3 percent had DNR-related information from social media, 169 (42.3%) of the 400 participants disagreed with DNR. The majority of respondents had no idea if there was a clear policy (69.5%) or fatwa (89.8%) regarding the DNR (Al Ahmadi et al., 2020). Furthermore, a 2019 cross-sectional study was conducted at KAUH in Jeddah, KSA, to assess medical students' and interns' knowledge and attitudes concerning DNR orders. The study included 429 interns and medical students in their preclinical and clinical years, and it showed that The majority of the members (73.2%) were aware of the DNR order; yet, more than half of them (58.3%) did not attend any DNR sessions or lectures regarding DNR (Aljohaney et al., 2015). There is a scarcity of research and studies related to DNR orders in the KSA, especially regarding medical students' knowledge and attitudes toward DNR orders in Jeddah, KSA.

To alleviate the gap in information regarding DNR decisions in the health-care community, this study aimed to assess the knowledge and attitudes of medical students toward DNR orders in Jeddah throughout the year 2020.

## 2. MATERIALS AND METHODS

This study was approved by Dr. Soliman Fakeeh Hospital Institutional Review Committee (DSFH-IRB) with approval number 94/IRB/2020, and written consent was obtained from all participants. The study followed a cross-sectional design. The study was conducted from 27 of June to 30 of July 2020 with medical students from Jeddah, KSA, and they represented King Abdulaziz University, King Saud bin Abdulaziz University for Health Sciences, Batterjee Medical College, and Ibn Sina Medical College. The Data collection process was carried out from July 2 to July 5, 2020.

The study sample's inclusion criteria consisted of medical students from all academic years in Jeddah, KSA. The exclusion criteria involved first-year College and medical students from Jeddah University and Fakeeh Medical College in all academic years, as these institutions do not provide a representative sample for this study. The sample size, which was estimated to be approximately 425, was calculated using Raosoft. To collect data, a validated online-based questionnaire was distributed among medical students of the inclusion criteria, and it was taken from a study that was conducted in outpatient clinics at KAUH, Jeddah, KSA (Al Ahmadi et al., 2020).

The distributed questionnaire was organized into four main parts. The first part was composed of four questions on demographic data, which covered age, gender, attended medical school, and current academic year. The second part questioned knowledge and attitudes, and it was divided into two sections: A and B. Section A was filled only by those who heard about DNR

orders. It then continued to evaluate their ability to define DNR and how they came across the DNR term and their previous experience with it. Section B started by the correct definition of DNR term, which is "A physician's order that is reported to all health-care providers is not to perform CPR if a patient's heart or respiration stops because it is futile, regardless of the age of the patient." This was followed by six multiple-choice questions that assessed participants' views on DNR orders and decision-making as well as the awareness of the subject on any established legal policies or fatwa on the DNR decision-making process in the KSA. Next, the third part consisted of questions on factors that the subject agrees to be a part of DNR decision-making and the subject's degree of agreement on a couple of provided statements regarding DNR orders. The fourth and final part of the questionnaire investigated participants' willingness to learn about DNR orders in a class setting as well as their opinion on whether a DNR patient is fit for organ donation.

Data entry was conducted using Microsoft Excel. The data was analyzed by the Statistical Package for the Social Sciences (SPSS) software, version 21. An estimation of the P-value <0.05 was considered statistically significant, and the confidence level was determined to be 95%.

### 3. RESULTS

The purpose of this study was to assess medical students' knowledge and attitudes toward DNR in Jeddah, KSA. In this cross-sectional study, 425 participating medical students were included. The majority of them were women (309, 72.71%), and their mean age was 22.31 with SD of +/- 1.970. The largest number of responses was from Ibn Sina National College, and it represented 123 (28.94%) of the participants. Medical students from all academic years participated in the questionnaire; however, there was a significant increase in participation from fourth-year students (117, 27.53%) (Table 1).

**Table 1** Demographic data

College		KAU		KSAUHS		ISNC		BMC		Total = n
Gender		Male	Female	Male	Female	Male	Female	Male	Female	
		21 (4.9%)	98 (23.1%)	23 (5.4%)	64 (15.1%)	47 (11.1%)	76 (17.9%)	25 (5.9%)	71 (16.7%)	425
Academic year	2nd	0 (0.0%)	0 (0.0%)	5 (4.3%)	16 (5.2%)	2 (1.7%)	1 (0.3%)	3 (2.6%)	6 (1.9%)	425
	3rd	0 (0.0%)	15 (4.9%)	7 (6%)	10 (3.2%)	6 (5.2%)	3 (1.0%)	2 (1.7%)	8 (2.6%)	
	4th	5 (4.3%)	30 (9.7%)	6 (5.2%)	24 (7.8%)	9 (7.8%)	16 (5.2%)	5 (4.3%)	22 (7.1%)	
	5th	4 (3.4%)	22 (7.1%)	3 (2.6%)	4 (1.3%)	10 (8.6%)	25 (8.1%)	7 (6.0%)	20 (6.5%)	
	6th	4 (3.4%)	5 (1.6%)	1 (0.9%)	5 (1.6%)	14 (12.1%)	25 (8.1%)	4 (3.4%)	10 (3.2%)	
	Intern	8 (6.9%)	26 (8.4%)	1 (0.9%)	5 (1.6%)	6 (5.2%)	6 (1.9%)	4 (3.4%)	5 (1.6%)	
Total		119 (28%)		87 (20.5%)		123 (28.9%)		96 (22.6%)		
King Abdulaziz University (KAU), King Saud Bin Abdulaziz University for Health Sciences (KSAUHS), Ibn Sina National College (ISNC), Batterjee Medical College (BMC)										

**Table 2** Knowledge and attitudes

Have you ever heard about the term DNR?	N (%)
Yes	352 (82.8%)
No	73 (17.2%)
Degree of agreement with DNR	N (%)
Agree	146 (34.4%)
Neutral	198 (46.6%)
Disagree	81 (19.1%)

Of the 425 participants, 352 were familiar with the DNR term. Regarding the degree of agreement with DNR, 198 (46.6%) of our sample were neutral with the DNR (Table 2). We assessed the knowledge of our respondents about DNR definition. Of the 352 who heard about the DNR term, only 101 (28.69%) were able to choose the correct one. The DNR term was more familiar to participants at higher academic levels ( $P=0.000290$ ), and there was also a statistical significance in the college where participants attended ( $P=0.000167$ ). As for their source of DNR-related knowledge, 213 (60.51%) gained knowledge from health-care providers (Figure 1).

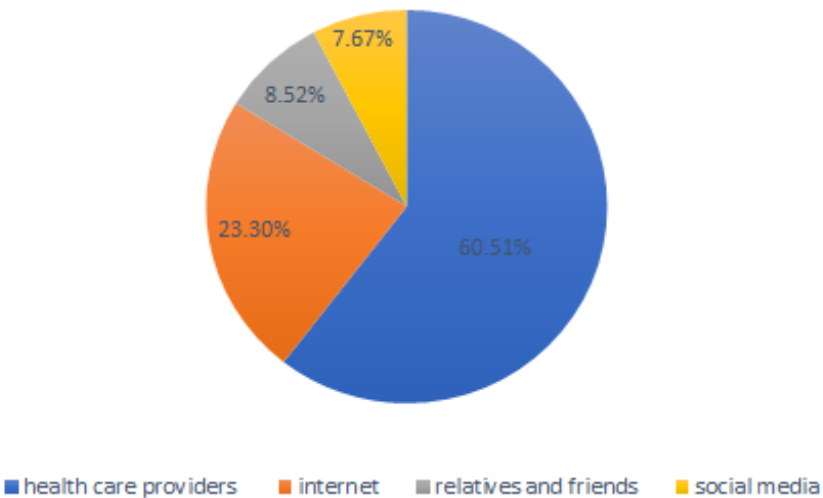


Figure 1 From where did you hear about DNR?

Regarding the experience of DNR, only 41 (11.6%) of the 105 had a previous experience, and it was mostly with 28 (68.3%) first-degree relatives. In addition, there was a statistically significant association with the academic year, with a p-value of 0.047625. We assessed the respondents' viewpoint regarding "Who do you think should be included in DNR decision-making?", and 158 (37.2%) of them chose the physician as the person who should be a part of the decision-making process. Regarding the question "Who do you think has the right to know about the DNR decision?," 387 (91.1%) indicated the parents as the persons who should be informed about the DNR decision. As for the patient's right to reject or accept the DNR order, 300 (70.6%) of our sample agreed and the participants were evaluated on their knowledge concerning the presence of a clear policy and fatwa about DNR in the KSA. The majority of the participants had no idea if there was a policy (253, 59.5%) or fatwa (266, 62.6%) regarding the DNR (Table 3).

Table 3 Knowledge and attitudes

	N (%)	
Who do you think should be included in DNR decision-making?		
Physician	158 (37.2%)	
Patient	211 (49.6%)	
First-degree relatives	56 (13.2%)	
Who do you think has the right to know about the DNR decision?	YES	NO
Parents	387 (91.1%)	38 (8.9%)
Siblings	289 (68%)	136 (32%)
Spouse	341 (80.2%)	84 (19.8%)
The patient has the right to reject the DNR decision.		
Agree	300 (70.6%)	
Neutral	93 (21.9%)	
Disagree	32 (7.5%)	
Do you know if there is a clear DNR policy in the KSA?		
Yes, there is.	144 (33.9%)	
No, there is not.	28 (6.6%)	
I do not know.	253 (59.5%)	

Do you know if there is a fatwa regarding DNR in the KSA?	146 (34.4%)
Yes, there is.	13 (3.1%)
No, there is not.	266 (62.6%)
I do not know.	
Have you had any previous experience with DNR?	
Yes	41 (11.6%)
No	311 (88.4%)
If yes, with whom?	
First-degree relatives	28 (68.3%)
Spouse	9 (22%)
Friends	4 (9.8%)

We assessed the participants' opinions on six different factors that should be taken into account when making a DNR decision. The most important factors were patient dignity (352, 82.8%), followed by the risk of going into a vegetative state (335, 78.8%) (Table 4). Many statements were subjected to the participants regarding DNR, and most of them agreed to accept conservative investigations and treatments with DNR patients (158, 37.2%). Most of the respondents (227, 53.4%) disagreed with withdrawing life-sustaining treatment from DNR-labeled patients. Additionally, encouragement of organ donation discussions with DNR patients and/or their families was agreed by 267 (62.8%) participants, while the majorities were against making patients unaware of their DNR status. Regarding the final statement, 312 (73.4%) agreed that the discussion was stressful (Table 5).

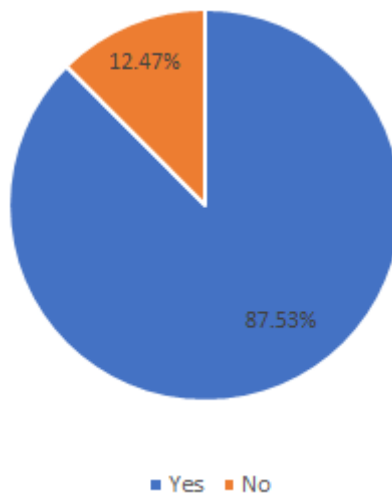
**Table 4** Related factors on DNR decision-making

Factor	YES	NO
Patient dignity	352 (82.8%)	73 (17.2%)
Religious concerns	331 (77.9%)	94 (22.1%)
Legal concerns	366 (86.1%)	59 (13.9%)
Risk of vegetative state	335 (78.8%)	90 (21.2%)
Limited ICU state	273 (64.2%)	152 (35.8%)
Medical resource efficiency and cost reduction	244 (57.4%)	181 (42.6%)

**Table 5** Participant's attitude toward DNR

Statement	Agree	Neutral	Disagree
It is acceptable to be conservative in investigations and treatments with patients who are labeled as DNR patients.	158 (37.2%)	132 (31.1%)	135 (31.8%)
It is acceptable to withdraw life-sustaining treatment from DNR-labeled patients.	87 (20.5%)	111 (26.1%)	227 (53.4%)
Organ donation should be discussed with DNR patients and/or their families.	267 (62.8%)	119 (28%)	39 (9.2%)
It is preferable if patients are unaware of their DNR status.	60 (14.1%)	95 (22.4%)	270 (63.5%)
Discussion about DNR order is stressful.	312 (73.4%)	94 (22.1%)	19 (4.5%)

Lastly, participants were asked if they were interested in taking a session or lecture regarding DNR, and 372 (87.53%) answered yes (Figure 2).



**Figure 2** Are you willing to take a lecture/session regarding DNR?

#### 4. DISCUSSION

Medical students and interns' knowledge and attitudes about DNR decisions is an essential issue in critical medical care; therefore, we conducted the current study in Jeddah, KSA, to evaluate the knowledge and attitudes toward DNR among medical students. Our data showed that the majority of medical students (352, 82.8%) heard about DNR term; however, only 101 (28.69%) of them were able to choose the correct definition of DNR. Both age and gender were not statistically significant to contribute to the result, while higher academic levels and the colleges where participants attended were shown to be associated with a greater outcome. Interns, on the other hand, demonstrated a better ability to define DNR, in which 30 (50%) of them chose the right answer. These results resemble those of Alsaati which stated that Interns had a better understanding of DNR compared to medical students (Alsaati et al., 2019). This could be explained by interns' exposure to DNR cases in the clinical setting as well as the medical students' evident lack of knowledge of DNR.

Regarding the source of DNR-related knowledge, the majority of our sample chose health-care providers as their primary source. In contrast to a prior study performed by Al Ahmadi where social media was the most reported answer (Al Ahmadi et al., 2020), our result could be explained by its focus on medical students. Perhaps medical students are first introduced into the DNR concept through lectures or medical studies, which is probably why health-care providers were their top choice.

We assessed the respondents' viewpoint regarding "Who do you think should be included in DNR decision-making?", and 211 (49.6%) of them chose the patient as the person who should be included and involved in the decision. Similarly, in a study conducted on patients and their families visiting KAUH's outpatient clinics, the most reported choice was the patient (Al Ahmadi et al., 2020). This raises the idea that medical students give most of their concern and respect to the autonomy of the patient, which is necessary, but it must be within limits. In fact, they must think more logically about the idea of DNR by looking at other important factors concerning the patient's case and prognosis, which is better to be decided by the physician, not the patient or their family.

##### Local DNR policy

In the Kingdom of Saudi Arabia, there are no current national DNR rules; each hospital has its own set of local guidelines. However, the Ministry of Health's (MOH) ongoing project to develop a National Policy for MOH and non-MOH hospitals for DNR is still to be accepted by Saudi Arabia's Health Council. The policies on DNR instructions in the case of terminally ill patients in hospitals in the KSA were developed on the basis of fatwa NO. 12086, issued June 30, 1988, 2nd edition of Ethics of the Medical Profession of the Saudi Health Specialties Commission and accepted in compliance with the International Standards of the Joint Commission (2006). The current DNR procedure that takes place in local hospitals goes as follows: following a discussion with the patient or his/her family, The DNR order will be signed electronically in the electronic health-care system by three doctors, including the attending doctor, another consultant and a staff physician, where the system will automatically flag the patient as a DNR patient. Then, the order is valid for six months. Recently, a new form of care goal has been developed that the patient or his deputy will sign for. The problem might be reported to the ethical committee if there is a disagreement between the patient/family and the doctor, which will further discuss the matter. When a patient is considered as a DNR, he or she will not receive CPR, ICU



admission, intubation, or inotropic support; however, all other treatment options, like support and comfort care, will be provided (Gouda et al., 2018).

In our study, participants were evaluated on their knowledge concerning the presence of a clear policy and fatwa about DNR in the KSA. The majority of respondents answered “I do not know” if there was a policy (253, 59.5%) or fatwa (266, 62.6%) established regarding DNR, which is consistent with a prior study performed by Amoudi. This highlighted the lack of understanding of the legal aspect that is associated with DNR in our medical community. As for the participants’ view of organ donation, the majority (267, 62.8%) favor organ donation is discussed with DNR patients and/or their families. This is consistent with the results of a 2016 study conducted in Jeddah regarding the interns’ and residents’ view points on DNR policies in the KSA, as 37 (42%) responded strongly agree, and 31 (35%) responded with agreement toward the issue (Amoudi et al., 2016). Last, participants were asked whether they were interested in attending a DNR lecture or session, and 372 (87.53%) answered yes. In another cross-sectional study performed on medical students and interns at KAUH in Jeddah to assess their knowledge about the DNR concept (Alsaati et al., 2019), they found that a high number of medical students believed that attending a DNR session or lecture would aid them to discuss it more competently with the patients and their families. This indicates a massive need to incorporate more DNR-related topics and discussions into medical curricula.

Our study has several limitations. First, the response rate was relatively low among the second- and third-year medical students. Also, there was an unequal distribution across gender in terms of collected responses, in which 75% of them were filled in by females.

## 5. CONCLUSION

The aim of this study is to evaluate the knowledge and attitudes of medical students toward DNR orders in Jeddah throughout the year 2020. Our results clearly showed a significant lack of understanding of DNR among the interns and medical students in Jeddah, KSA. Therefore, we suggest that more ethical education regarding DNR and its policies should be conducted during medical education and residency training programs in the KSA. This is achieved through an evidence-based curriculum that pays more attention to DNR and its related issues. In the future, this approach will hopefully provide instructions that are necessary in improving physicians’ confidence and effectiveness when facing DNR orders for critically ill patients. Additionally, we recommend conducting further studies on DNR knowledge and attitudes among the medical community across the KSA to collect data from a larger and more diverse sample.

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### Conflict of interest

The authors declare no conflict of interest.

### Author Contribution

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**Data and materials availability**

All data associated with this study are present in the paper.

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